

Docket No.: M4065.0699/P699-B
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Terry L. Gilton

Application No.: Not Yet Assigned

Filed: Concurrently Herewith

Art Unit: N/A

For: RESISTANCE VARIABLE DEVICE,
ANALOG MEMORY DEVICE AND
PRORAMMABLE MEMORY CELL

Examiner: Not Yet Assigned

INFORMATION DISCLOSURE STATEMENT (IDS)

MS Patent Application
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 C.F.R. §§ 1.56, 1.97 and 1.98, the attention of the Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement accompanies the new patent application submitted herewith.

Those patents or publications which are marked with a double asterisk (**) next to the Cite No. in the attached form PTO/SB/08 are not supplied because they were previously cited by or submitted to the Office in a prior application number 10/264,677, filed October 3, 2002 and relied upon in this application for an earlier filing date under 35 U.S.C. § 120.

In accordance with 37 C.F.R. § 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made. In accordance with 37 C.F.R. § 1.97(h), the filing of this Information Disclosure statement shall not be construed to be an admission that any patent, publication or other information referred to therein is "prior art" for this invention unless specifically designated as such.

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98 and the Examiner is respectfully requested to consider the listed references.

The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 04-1073, under Order No. M4065.0699/P699-B. A duplicate copy of this paper is enclosed.

Dated: February 13, 2004

Respectfully submitted,

By 

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Substitute for form 1449A/B/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>				Complete if Known	
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Sheet	1	of	14	Attorney Docket Number	M4065.0699/P699-B

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
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		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)				
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**	CB	Das, et al., "Theory of the Characteristic Curves of the Silver Chalcogenide Glass Inorganic Photoresists," Appl. Phys. Lett., 54(18), pp. 1745-1747, May 1, 1989.	
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**	BD	WO 97/48032	12/1997	WIPO		
**	BE	WO 99/28914	06/1999	WIPO		

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**	CH	Huggett, et al., "Development of Silver Sensitized Germanium Selenide Photoresist by Reactive Sputter Etching in SF ₆ ," Appl. Phys. Lett, 42, pp. 592-594, April 1, 1983.		
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**	CZ1	Boolchand, "The Maximum in Glass Transition Temperature (T _g) Near x=1/3 in GexSe1-x Glasses," Asian Journal of Physics, 9, 709-72, 2000.		
**	CA2	Boolchand, et al., "Mobile Silver Ions and Glass Formation in Solid Electrolytes," Nature, 410, 1070-1073, 2001.		
**	CB2	Boolchand, et al., "Discovery of the Intermediate Phase in Chalcogenide Glasses," J. Optoelectronics and Advanced Materials, 3, 703, 2001.		

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Sheet	7	of	14		

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**	CC2	Boolchand, et al., "Onset of Rigidity in Steps in Chalcogenide Glasses," Properties and Applications of Amorphous Materials, M.F. Thorpe and Tichy, L. (eds.) Kluwer Academic Publishers, the Netherlands, pp. 97-132, 2001.		
**	CD2	Boolchand, et al., "Structural Ordering of Evaporated Amorphous Chalcogenide Alloy Films: Role of Thermal Annealing," Diffusion and Defect Data, Vol. 53-54, 415-420, 1987.		
**	CE2	Boolchand, et al., "Structural Origin of Broken Chemical Order in a GeSe ₂ Glass," Phys. Rev. B 25, 2975-2978, 1982.		
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**	CJ2	Bresser, et al., "Intrinsically Broken Chalcogen Chemical Order in Stoichiometric Glasses," Journal de Physique, 42, C4-193-C4-196, 1981.		
**	CK2	Bresser, et al., "Molecular Phase Separation and Cluster Size in GeSe ₂ Glass," Hyperfine Interactions, 27, 389-392, 1986.		
**	CL2	Cahen, et al., "Room-Temperature, Electric Field Induced Creation of Stable Devices in CuInSe ₂ Crystals," Science, 258, 271-274, 1992.		
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**	CN2	Chen, et al., "Whisker Growth Induced by Ag Photodoping in Glassy Ge _x Se _{1-x} Films," Appl. Phys. Lett., 37, 1075-1077, 1980.		
**	C02	Chen, et al., "Role of Nitrogen in the Crystallization of Silicon Nitride-doped Chalcogenide Glasses," J. Am. Ceram. Soc., 82, 2934-2936, 1999.		
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**	CQ2	Cohen, et al., "A Model for an Amorphous Semiconductor Memory Device," J. Non-Cryst. Solids 8-10, 885-891, 1972.		
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**	CU2	Dearnaley, et al., "Electrical Phenomena in Amorphous Oxide Films," Rep. Prog. Phys., 33, 1129-1191, 1970.		
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**	CW2	den Boer, "Threshold Switching in Hydrogenated Amorphous Silicon," Appl. Phys. Lett., 40, 812-813, 1982.		
**	CX2	Drusedau, et al., "The Hydrogenated Amorphous Silicon/nanodisperse Metal (SIMAL) System-Films of Unique Electronic Properties," J. Non-Cryst. Solids, 198-200, 829-832, 1996.		
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**	CG3	El-Zahed, et al., "Influence of Composition on the Electrical and Optical Properties of Ge ₂₀ BixSe _{80-x} Films," Thin Solid Films, 376, 236-240, 2000.		
**	CH3	Fadel, "Switching Phenomenon in Evaporated Se-Ge-As Thin Films of Amorphous Chalcogenide Glass," Vacuum, 44, 851-855, 1993.		
**	CI3	Fadel, M.; El-Shair, H.T., Electrical, thermal and optical properties of Se ₇₅ Ge ₇ Sb ₁₈ , Vacuum 43 (1992) 253-257.		
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**	CK3	Feng, et al., "Role of Network Connectivity on the Elastic, Plastic and Thermal Behavior of Covalent Glasses," J. Non-Cryst. Solids, 222, 137-143, 1997.		
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**	CM3	Fleury, et al., "Conductivity and Crystallization of Amorphous Selenium," Phys. Stat. Sol. (a) 64, 311-316, 1981.		
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**	CO3	Fritzsche, "Electronic Phenomena in Amorphous Semiconductors," Annual Review of Materials Science, 2, 697-744, 1972.		
**	CP3	Gates, et al., "Single-crystalline Nanowires of Ag ₂ Se can be Synthesized by Templating against Nanowires of Trigonal Se," J. Am. Chem. Soc. (2001) currently ASAP.		

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**	CS3	Guin, et al., "Hardness, Toughness, and Scratchability of Germanium-selenium Chalcogenide Glasses," J. Am. Ceram. Soc., 85, 1545-52, 2002.		
**	CT3	Gupta, "On Electrical Switching and Memory Effects in Amorphous Chalcogenides," J. Non-Cryst. Sol., 3, 148-154, 1970.		
**	CU3	Haberland, et al., "New Experiments on the Charge-controlled Switching Effect in Amorphous Semiconductors," J. Non-Cryst. Solids, 8-10, 408-414, 1972.		
**	CV3	Haifz, et al., "Effect of Composition on the Structure and Electrical Properties of As-Se-Cu Glasses," J. Apply. Phys., 54, 1950-1954, 1983.		
**	CW3	Hajto, et al., "Quantization Effects in Metal/a-Si:H/metal Devices," Int. J. Electronics, 73, 911-913, 1992.		
**	CX3	Hajto, et al., "DC and AC Measurements on Metal/a-Si:H/metal Room Temperature Quantised Resistance Devices," J. Non-Cryst. Solids, 266-269, 1058-1061, 2000.		
**	CY3	Hajto, et al., "Theory of Room Temperature Quantized Resistance Effects in Metal-a-Si:H-metal Thin Film Structures," J. Non-Cryst. Solids, 198-200, 825-828, 1996.		
**	CZ3	Hajto, et al., "Analogue Memory and Ballistic Electron Effects in Metal-amorphous Silicon Structures," Phil. Mag. B 63, 349-369, 1991.		
**	CA4	Hayashi, et al., "Polarized Memory Switching in Amorphous Se Film," Japan. J. Appl. Phys., 13, 1163-1164, 1974.		
**	CB4	Hegab, et al., "Memory Switching Phenomena in Thin Films of Chalcogenide Semiconductors," Vacuum, 45, 459-462, 1994.		
**	CC4	Hong, et al., "Switching Behavior in II-IV-V2 Amorphous Semiconductor Systems," J. Non-Cryst. Solids, 116, 191-200, 1990.		
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**	CZ4	Hajto, et al., "Analogue Memory and Ballistic Electron Effects in Metal-amorphous Silicon Structures," Phil. Mag. B 63, 349-369, 1991.		
**	CA5	Hayashi, et al., "Polarized Memory Switching in Amorphous Se Film," Japan. J. Appl. Phys., 13, 1163-1164, 1974.		
**	CB5	Hegab, et al., "Memory Switching Phenomena in Thin Films of Chalcogenide Semiconductors," Vacuum, 45, 459-462, 1994.		
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**	CE5	Hu, et al., "Constant Current Forming in Cr/p+a-Si:H/V Thin Film Devices," J. Non-Cryst. Solids, 227-230, 1187-1191, 1998.		
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**	CM5	Joullie, et al., "Electrical Properties of the Amorphous Alloy As2Se5," Mat. Res. Bull., 8, 433-442, 1973.		
**	CN5	Kaplan, et al., "Electrothermal Switching in Amorphous Semiconductors," J. Non-Cryst. Solids, 8-10, 538-543, 1972.		
**	CO5	Kawaguchi, et al., "Analysis of Change in Optical Transmission Spectra Resulting from Ag Photodoping in Chalcogenide Film," Jpn. J. Appl. Phys., 26, 15-21, 1987.		
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**	CY5	Matsushita, et al., "Polarized Memory Effect Observed on Se-SnO ₂ System," Jap. J. Appl. Phys., 11, 1657-1662, 1972.		
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**	CH6	Nakayama, et al., "Nonvolatile Memory Based on Phase Transitions in Chalcogenide Thin Films," Jpn. J. Appl. Phys., 32, 564-569, 1993.		
**	CI6	Nakayama, et al., "Submicron Nonvolatile Memory Cell Based on Reversible Phase Transition in Chalcogenide Glasses," Jpn. J. Appl. Phys., 39, 6157-6161, 2000.		
**	CJ6	Nang, et al., "Electrical and Optical Parameters of GexSe _{1-x} Amorphous Thin Films," Jap. J. App. Phys., 15, 849-853, 1976.		
**	CK6	Narayanan, et al., "Evidence Concerning the Effect of Topology on Electrical Switching in Chalcogenide Network Glasses," Phys. Rev. B, 54, 4413-4415, 1996.		
**	CL6	Neale, et al., "The Application of Amorphous Materials to Computer Memories," IEEE transactions on electron dev. Ed-20, 195-209, 1973.		
**	CM6	Ovshinsky, "Reversible Structural Transformations in Amorphous Semiconductors for Memory and Logic," Metallurgical transactions, 2, 641-645, 1971.		
**	CN6	Ovshinsky, "Reversible Electrical Switching Phenomena in Disordered Structures," Phys. Rev. Lett., 21, 1450-1453, 1968.		
**	CO6	Owen, et al., "New Amorphous-silicon Electrically Programmable Nonvolatile Switching Device," IEEE Proc., 129, 51-54, 1982.		
**	CP6	Owen, et al., "Photo-induced Structural and Physico-chemical Changes in Amorphous Chalcogenide Semiconductors," Phil. Mag. B 52, 347-362, 1985.		
**	CQ6	Owen, et al., "Switching in Amorphous Devices," Int. J. Electronics, 73, 897-906, 1992.		

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				First Named Inventor	Terry L. Gilton
				Art Unit	N/A
				Examiner Name	Not Yet Assigned
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**	CR6	Pearson, et al., "Filamentary Conduction in Semiconducting Glass Diodes," App. Phys. Lett., 14, 280-282, 1969.		
**	CS6	Pinto, et al., "Electric Field Induced Memory Switching in Thin Films of the Chalcogenide System Ge-As-Se," Appl. Phys. Lett., 19, 221-223, 1971.		
**	CT6	Popescu, "The Effect of Local Non-uniformities on Thermal Switching and High Field Behavior of Structures with Chalcogenide Glasses," Solid-state Electronics, 18, 671-681, 1975.		
**	CU6	Popescu, et al., "The Contribution of the Lateral Thermal Instability to the Switching Phenomenon," J. Non-Cryst. Solids, 8-10, 531-537, 1972.		
**	CV6	Popov, et al., "Memory and Threshold Switching Effects in Amorphous Selenium," Phys. Stat. Sol. (a) 44, K71-K73, 1977.		
**	CW6	Prakash, et al., "Easily Reversible Memory Switching in Ge-As-Te Glasses," J. Phys. D: Appl. Phys., 29, 2004-2008, 1996.		
**	CX6	Rahman, et al., "Electronic Switching in Ge-Bi-Se-Te Glasses," Mat. Sci. and Eng. B12, 219-222, 1992.		
**	CY6	Ramesh, et al., "Electrical Switching in Germanium Telluride Glasses Doped With Cu and Ag," Appl. Phys. A 69, 421-425, 1999.		
**	CZ6	Rose, et al., "Amorphous Silicon Analogue Memory Devices," J. Non-Cryst. Solids, 115, 168-170, 1989.		
**	CA7	Rose, et al., "Aspects of Non-volatility in a -Si:H Memory Devices," Mat. Res. Soc. Symp. Proc. V 258, 1075-1080, 1992.		
**	CB7	Schuoocker, et al., "On the Reliability of Amorphous Chalcogenide Switching Devices," J. Non-Cryst. Solids, 29, 397-407, 1978.		
**	CC7	Sharma, et al., "Electrical Conductivity Measurements of Evaporated Selenium Films in Vacuum," Proc. Indian Natn. Sci. Acad. 46, A, 362-368, 1980.		
**	CD7	Sharma, "Structural, Electrical and Optical Properties of Silver Selenide Films," Ind. J. Of Pure and Applied Phys., 35, 424-427, 1997.		
**	CE7	Snell, et al., "Analogue Memory Effects in Metal/a-Si:H/metal Memory Devices," J. Non-Cryst. Solids, 137-138, 1257-1262, 1991.		
**	CF7	Snell, et al., "Analogue Memory Effects in Metal/a-Si:H/metal Thin Film Structures," Mat. Res. Soc. Symp. Proc. V 297, 1017-1021, 1993.		
**	CG7	Steventon, "Microfilaments in Amorphous Chalcogenide Memory Devices," J. Phys. D: Appl. Phys., 8, L120-L122, 1975.		
**	CH7	Steventon, "The Switching Mechanisms in Amorphous Chalcogenide Memory Devices," J. Non-Cryst. Solids, 21, 319-329, 1976.		
**	CI7	Stocker, "Bulk and Thin Film Switching and Memory Effects in Semiconducting Chalcogenide Glasses," App. Phys. Lett., 15, 55-57, 1969.		

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**	CJ7	Tanaka, "Ionic and Mixed Conductions in Ag Photodoping Process," Mod. Phys. Lett B 4, 1373-1377, 1990.		
**	CK7	Tanaka, et al., "Thermal Effects on Switching Phenomenon in Chalcogenide Amorphous Semiconductors," Solid State Comm., 8, 387-389, 1970.		
**	CL7	Thornburg, "Memory Switching in a Type I Amorphous Chalcogenide," J. Elect. Mat., 2, 3-15, 1973.		
**	CM7	Thornburg, "Memory Switching in Amorphous Arsenic Triselenide," J. Non-Cryst. Solids, 11, 113-120, 1972.		
**	CN7	Thornburg, et al., "Electric Field Enhanced Phase Separation and Memory Switching in Amorphous Arsenic Triselenide," Journal(?), 4609-4612, 1972.		
**	CO7	Tichy, et al., "Remark on the Glass-forming Ability in GexSe1-x and AsxSe1-x Systems," J. Non-Cryst. Solids, 261, 277-281, 2000.		
**	CP7	Titus, et al., "Electrical Switching and Short-range Order in As-Te Glasses," Phys. Rev. B 48, 14650-14652, 1993.		
**	CQ7	Tranchant, et al., "Silver Chalcogenide Glasses Ag-Ge-Se: Ionic Conduction and Exafs Structural Investigation, Transport-structure Relations in Fast Ion and Mixed Conductors," Proceedings of the 6th Riso International symposium, 9-13, September 1985.		
**	CR7	Tregouet, et al., "Silver Movements in Ag2Te Thin Films: Switching and Memory Effects," Thin Solid Films, 57, 49-54, 1979.		
**	CS7	Uemura, et al., "Thermally Induced Crystallization of Amorphous Ge0.4Se0.6," J. Non-Cryst. Solids, 117-118, 219-221, 1990.		
**	CT7	Uttecht, et al., "Electric Field Induced Filament Formation in As-Te-Ge Glass," J. Non-Cryst. Solids, 2, 358-370, 1970.		
**	CU7	Viger, et al., "Anomalous Behaviour of Amorphous Selenium Films," J. Non-Cryst. Solids, 33, 267-272, 1976.		
**	CV7	Vodenicharov, et al., "Electrode-limited Currents in the Thin-film M-GeSe-M System," Mat. Chem. And Phys., 21, 447-454, 1989.		
**	CW7	Wang, et al., "High-performance Metal/silicide Antifuse," IEEE Electron Dev. Lett., 13, 471-472, 1992.		
**	CX7	Weirauch, "Threshold Switching and Thermal Filaments in Amorphous Semiconductors," App. Phys. Lett., 16, 72-73, 1970.		
**	CY7	West, et al., "Equivalent Circuit Modeling of the Ag As0.24S0.36Ag0.40 Ag System Prepared by Photodissolution of Ag," J. Electrochem. Soc., 145, 2971-2974, 1998.		
**	CZ7	Zhang, et al., "Variation of Glass Transition Temperature, Tg, With Average Coordination Number, <m>, in Network Glasses: Evidence of a Threshold Behavior in the Slope dTg/d<m> at the Rigidity Percolation Threshold (<m>=2.4)," J. Non-Cryst. Solids, 151, 149-154, 1992.		

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